nation; objections to the physical theory of staining; chromatin and the fundamental doctrines of staining. Here again experiments upon substances of known chemical composition occupy a large part of the space.

Part III deals with the structure of protoplasm. Spindles, centrosomes, and radiations are thoroughly discussed and artificial figures are compared with those occurring normally. Chromatin is treated in the paragraphs on granules. The various theories of the structure of protoplasm, as the granula theory, the network theory, the filar theory, and the foam-structure theory, are critically reviewed.—CHAS. J. CHAMBERLAIN.

Knuth's Handbook.

STUDENTS of the interrelations between plants and their pollinators, constituting a branch of what the Germans call "biology," and what Americans are coming to call "ecology," have learned their first lessons in large part from Christian Konrad Sprengel, once rector of the Lutheran Stadtschule at Spandau, Charles Darwin, and Hermann Müller, late Professor in the Realschule at Lippstadt. Some years since, Sprengel's book, "Das entdeckte Geheimnis der Natur im Bau und in der Befruchtung der Blumen," was reissued by Professor Paul Knuth, of the Ober-Realschule at Kiel; and an English translation of Müller's "Befruchtung der Blumen" has brought his work within reach of many persons not familiar with the German language. It appears that the original edition is no longer procurable, and Professor Knuth set himself the task of revising and reissuing it. The progress of this branch of science has been so great in the last quarter century, however, that he has found it better to write an independent work,[5] based on Müller's writings, but brought up to date.

For reasons not perfectly clear to the uninitiated, this has been divided into three parts: an introduction and bibliography, pollination observations in Europe and the arctic region, and extra-European studies in the ecology of flowers. The first two volumes are now issued, in three parts, ending with a comprehensive index. The third volume is announced as in course of preparation, and will be received with no little satisfaction on its completion. Few lines of botanical work are so fascinating or so accessible to the beginner as pollination studies, and with this book before him he should be able readily to sift the known from the new in his observations, so that the latter may be added to the former in suitable published form. It is doubtless too much to hope for an English translation, but the absence of one is only one more indication of the urgent need of a working knowledge of German on the part of every student ambitious to distinguish himself in modern scientific work. —WILLIAM TRELEASE.

[5] KNUTH, PAUL: Handbuch der Blutenbiologie unter Zugrundelegung von Hermann Müller's Werk, "Die Befruchtung der Blumen durch Insekten." Engelmann: Leipzig. 1898–9.